

**REMARKS**

**I. Introduction**

In response to the pending final Office Action, Applicants have amended independent claim 1 to further clarify the subject matter of the specification and to overcome the objection to claim 1. Support for the amendment to claim 1 may be found, for example, in paragraphs [0050]-[0055] and [0108]-[0112] of the specification. No new matter has been added.

Applicants respectfully submit that all pending claims as currently amended are patentable over the cited prior art.

**II. The Rejection Of Claims 1-3 Under 35 U.S.C. § 102**

Claims 1-3 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Shimada (US 2003/0201685). Applicants respectfully submit that Shimada fails to anticipate claims 1-3 for at least the following reasons.

With regard to the present disclosure, independent claim 1 recites a rotor using an electrical steel sheet with low iron loss, the rotor comprising a bridge side on an inner circumference of a magnet insertion window of said rotor having a layer which is formed across an inner wall thereof and is work hardened due to a compression residual stress having added to the inner wall. The compression residual stress is caused by applying a laser peening of irradiating at an angle relative to the inner wall of the bridge side on the inner circumference of the magnet insertion window with a laser through a liquid to transmit a shockwave resulting from a high pressure plasma produced over said inner wall by said laser to said inner wall.

One feature of the present disclosure is a bridge side on an inner circumference of a magnet insertion window of a rotor has a layer formed across an inner wall. The layer is work

hardened due to a compression residual stress added to the inner wall. For example, Fig. 5 shows an inner circumference of the magnet insertion window of the rotor 200 which is work hardened from a traveling path of a laser which irradiates a moving spot S along the whole inner wall of the bridge side on the inner circumference. As a result, the process of the inner circumference of the magnet insertion windows 201 is performed uniformly. Since a plurality of the rotors are stacked, labor saving results compared to a case of processing one by one are obtained. Also, the laser can be more efficiently used as the number of irradiations (number of pulses) for the presser plate can be reduced.

In contrast, Shimada teaches, a laser that is orthogonally applied to a surface of an electrical steel sheet 10. As is discussed in paragraph [0071] of Shimada, because of a plasma PL occurring at the surface of the electrical steel sheet 10, shock waves are generated at that place. The shock waves act on the area 17 that involve the area to be formed with the outer-peripheral hardened portion 11 or the area to be formed with the opening-opening hardened portion 12 such that the area 17 is subject to the peening treatment to be hardened, whereupon the stage 10 is sequentially rotated and moved to compel all of the areas 17 to be uniformly peened. Thus, as is shown in Fig. 4, an inner wall of the bridge side 16, 12 on an inner circumference of a magnet insertion window 2, 3 is not irradiated with the laser (see, Figs. 1-3 and 9). Accordingly, as Shimada fails to teach or suggest all of the limitations of amended claim 1.

As the Examiner is aware, anticipation under 35 U.S.C. § 102 requires that each element of the claim in issue be found, either expressly described or under principles of inherency, in a single prior art reference, *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983). As Shimada, at a minimum, fails to disclose a rotor using an electrical steel sheet

with low iron loss, the rotor comprising a bridge side on an inner circumference of a magnet insertion window of said rotor having a layer which is formed across an inner wall thereof and is work hardened due to a compression residual stress having added to the inner wall, it is clear that Shimada fails to anticipate claim 1. Therefore, it is respectfully submitted that claim 1 is patentable and allowable over Shimada and accordingly, Applicants request that the § 102 rejections of claim 1 be withdrawn.

**III. The Rejection Of Claims 1-2 And 4-5 Under 35 U.S.C. § 103**

Claims 1-2 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakamura (JP 11018324) in view of Clauer et al. (UP 2003/0024915); and claims 4-5 as being unpatentable over Shimada et al. (US 2003/0201685) in view of Edwards et al. (USP No. 6,848,495). Applicants respectfully traverse these rejections of the pending claims for at least the following reasons.

As mentioned above, amended claim 1 features a bridge side on an inner circumference of a magnet insertion window of a rotor has a layer formed across an inner wall that is work hardened due to a compression residual stress added to the inner wall.

It was found that Nakamura discloses the limitations of claim 1. However, Nakamura teaches, in paragraph [0020], an inner wall 42 of a slot 12 lateral to a bridge side 20 is irradiated with a laser beam. The focus is in an up and down direction relative to the axial direction, and is made to move according to a straight shape over all the leaves. As a result, melting of the laser beam portions of each leaf 38 can be carried out, and all the leaves unified. (see, Fig. 1 of Nakamura). As such, in Nakamura, the inner wall 42 of the bridge side 20 on an inner circumference of the slot 16 is not irradiated with a laser. Accordingly, Nakamura fails to teach

or suggest a bridge side on an inner circumference of a magnet insertion window of a rotor having a layer formed across an inner wall that is work hardened due to a compression residual stress added to the inner wall.

Moreover, Clauer does not, and is not relied upon to remedy this deficiency. As such the combination of Nakamura and Clauer fails to teach or suggest all of the limitations of amended claim 1.

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. As is clearly shown, Nakamura and Clauer do not disclose a rotor using an electrical steel sheet with low iron loss, the rotor comprising a bridge side on an inner circumference of a magnet insertion window of said rotor having a layer which is formed across an inner wall thereof and is work hardened due to a compression residual stress having added to the inner wall. Accordingly, Applicants submit that Nakamura and Clauer do not render claim 1 of the present disclosure obvious and as such, claim 1 is patentable and allowable over the cited prior art. Accordingly, Applicants respectfully request that the § 103(a) rejections of claim 1 be withdrawn.

Furthermore, Edwards does not and is not relied upon to remedy the deficiencies of Shimada.

**IV. All Dependent Claims Are Allowable Because The  
Independent Claim From Which They Depend Is Allowable**

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*,

819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claim 1 is patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance. As such, Applicants respectfully request that the § 102 rejections of claims 2-3 and the § 103 rejections of claims 2, 4-5 be withdrawn.


**V. Conclusion**

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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